

# **EXHIBIT 29**

UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF CALIFORNIA  
SAN JOSE DIVISION

CISCO SYSTEMS, INC.,

Plaintiff,

v.

ARISTA NETWORKS, INC.,

Defendant.

Case No. 5:14-cv-05344-BLF (PSG)

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**EXPERT REPORT OF JOHN R. BLACK, JR.**

**June 3, 2016**

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SUBJECT TO PROTECTIVE ORDER**

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terms and identify several mandatory (or optional) keywords that must (or may) be added immediately after those terms, such as “dot1x.” A different vendor, however, may denote “aaa accounting dot1x” to be root command terms, and identify several mandatory (or optional) keywords that must (or may) be added immediately after those terms. Therefore, the syntax for a valid and complete command may be documented in a command reference manual differently depending on the vendor and networking device.

115. As an example, Cisco IOS command reference manuals generally follow the following command syntax conventions:

<b>Convention</b>	<b>Description</b>
<b>bold</b>	Bold text indicates commands and keywords that the user enters as shown
<i>italic</i>	Italic text indicates arguments for which the user supplies values
[x]	Square brackets enclose an optional keyword or argument.
...	An ellipsis (three consecutive nonbolded periods without spaces) after a syntax element indicates that the element can be repeated.
	A vertical line, sometimes called a “pipe,” that is enclosed within braces or square brackets indicates a choice within a set of keywords or arguments.
[x   y]	Square brackets enclosing keywords or arguments separated by a pipe indicate an optional choice.
{x   y}	Braces enclosing keywords or arguments separated by a pipe indicate a required choice.
[x {y   z}]	Braces and a pipe within square brackets indicate a required choice within an optional element.

116. Arista EOS user documentation follows a different convention for documenting the acceptable command syntaxes for EOS CLI commands, which can be seen by comparing the ARISTA EOS User Manual and Cisco IOS user documentation

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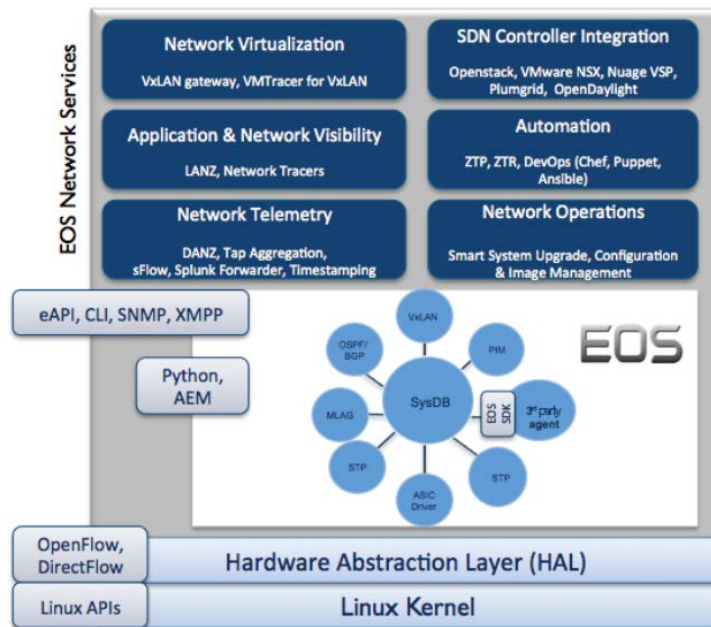
side-by-side.

117. Many CLIs, including shells like bash (the default CLI shell on most Linux systems), also support functionality called “command aliasing.” Command aliasing makes it possible to invoke a command (or group of commands) that the CLI would recognize as a valid command by entering a different preset string. In other words, it allows a user of the CLI to create different words or abbreviations as an alias for a command (including any mandatory or optional keywords for that command), and use that alias in the same way that the original command is used. This is normally done because the user types in the same long command frequently and he or she wishes to have a shorthand command that does the same thing. For example, if a user types “show ip interface brief” quite a lot, he or she may prefer to create an alias like “shbr” that can be typed in instead, and the operating system will expand “shbr” to “show ip interface brief” automatically.<sup>31</sup> Cisco IOS, Arista EOS, HP ProCurve, HP Comware, and others support this functionality. By way of example, a user could use this alias functionality with HP Comware and create aliases for “display” commands that allow the user to type in “show” instead of “display.” In EOS, the “alias” command is used to create an alias for a CLI command. Once an alias is created, entering the alias into the EOS CLI executes the corresponding command.

118. There are other user interfaces commonly used to facilitate interaction between a human and a computer. The most well-known of these would be a GUI. When an engineer or artist or web-designer designs a GUI, there are many choices about how to organize the interface into buttons, pull-downs, sliders, menus, text windows, etc.,

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<sup>31</sup> The user will not see the expansion of “shbr” to “show ip interface brief”; the system will simply interpret “shbr” to mean “show ip interface brief” internally.

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166. When an operator issues a command to change STP parameters into the Arista CLI, the CLI agent parses that command and sends a message to the central database indicating the new parameters. The central database then records the changes and notifies the STP agent that its parameters have been updated. The STP agent then operates according to those settings until further changes are made. If the STP agent starts to have problems (eg, it locks up, crashes, ceases to register its heartbeat with the system), ProcMgr will kill the STP agent and restart it without any operator intervention. An old-style monolithic product simply cannot operate in this fashion, even though it may support “spanning-tree vlan”<sup>54</sup>.

167. In short, Arista often supports important well-established command

<sup>54</sup> Once again “spanning-tree vlan” is only a partial command; neither the Cisco CLI nor the Arista CLI will accept this prefix without at least specifying a vlan ID. For Cisco, a single vlan ID is required, followed by a large number of optional parameters. See ARISTANDCA00241665 (“Cisco IOS LAN Switching Command Reference November 2010”). For Arista, a single vlan ID or a range of vlan IDs are specified and no further optional parameters are accepted. See CSI-CLI-06302874 at 1051 (Arista Networks User Manual for Arista EOS v.4.15.3F)

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- “area nssa translate type7 always”
- “area range”
- “area stub”
- “default-information originate”
- ”default-metric”
- “log-adjacency-changes”
- “maximum-paths”
- “passive-interface”
- “router-id”

490. Cisco also lists the purported “neighbor peer-group” command twice, and identifies in a parenthetical that one command is for “assigning members” and another is for “creating.” The words in parentheses are not typed into the CLI as part of the command.

491. In the course of analyzing the accused “commands” for purposes of this Report, I also observed that many of the so-called “commands” disputed in this litigation are not syntactically valid commands that the Cisco IOS CLI parser and/or the Arista EOS CLI parser would accept as a valid and complete command. In other words, many of the accused “commands” are not valid CLI commands at all, but would trigger an incomplete command error from the CLI if entered by an end user because they are missing additional parameters that must be provided before the parser will perform the command’s associated functionality. These incomplete commands can be seen when comparing the list in Exhibit 1 to Cisco Second Amended Complaint (or the list in Exhibit F to Cisco’s discovery responses) to the command reference user documentation

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pertaining to each such command (or fragment).

492. I may refer to the accused CLI “commands” throughout this Report as simply the accused commands, without indicating that some accused “commands” are not actually complete and syntactically valid CLI commands. However, this observation and the important distinction between valid and incomplete commands, and Cisco’s inconsistent approach in selecting a seemingly arbitrary collection of complete and incomplete CLI commands, applies to all portions of my Report.

493. I also note that several of the accused Arista CLI commands, and several purportedly copied Cisco CLI commands, are not valid commands at all. For example:

- The “ip-community-list standard” command does not appear to be a valid command documented in any Cisco user manual, and is not a valid command recognized by the Arista EOS CLI.
- The “isis passive-interface” command does not appear to be a valid command documented in any Cisco user manual, and is not a valid command recognized by the Arista EOS CLI.
- The “default-metric” command is not supported by Arista for OSPF version 2, as Cisco contends.

494. Moreover, some of the accused commands serve an entirely different functional purpose in Arista EOS than the Cisco IOS command that Cisco contends is similar. For example, the “ip protocol” command supported by the Arista EOS CLI configures a “Monitor Reachability Probe Transmitter” feature that is unique to Arista’s switches. *See* CSI-CLI-06302874 at 2133 (Arista Networks User Manual for Arista EOS v.4.15.3F) (“The ip protocol command specifies the IP protocol that the switch uses to

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703. To the extent that Cisco's asserted copyrights grants them a limited monopoly over any asserted aspects of the Cisco IOS CLI, they are leveraging that limited monopoly to exert control on areas beyond the monopoly.

**XIV. CONCLUSION**

704. As noted throughout this report, these opinions are based upon the information available to me gathered during discovery. I have not had the benefit of reviewing Cisco's opening expert reports. Given that all of my opinions expressed herein are ultimately in response to whatever theories and contentions Cisco asserts in its case, I intend to refine, and supplement these opinions in response to Cisco's expert reports. In addition, as noted throughout, there are a number of areas where Cisco has either refused to provide, or has not yet provided, the information Arista has requested in discovery. Should Cisco provide further facts or documents or testimony, I will consider those additions in due course to the extent they are relevant to my analysis.

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